CLAIMS

1. A novel marine cyano bacterium *O.Lyngbya, O.Oscillatoria, O.Sprulina, O.Anabaena* and *O.Synechocystis* being deposited with ATCC having accession no ....., are used for removal of calcium ions from sea-brine and sub-soil brine.
2. A new use of marine cyano bacterium *Lyngbya, Oscillatoria, Sprulina,Anabaena* and *Synechocystis* being deposited with ATCC having accession no.....for the removal of calcium ions from sea-brine and sub-soil brine having density range 10 to 25.5°Be', said use comprising culturing the cyanobacteria, inoculating the said cyanobacteria culture to raw brine of 10 to 25.5°Be', filtering the resultant mixture to obtain a brine having less calcium and to separate the cyanobacteria which can be reused if desired.
3. Use as claimed in claim 2 wherein, the marine bacteria used are filamentous in nature, possess photosynthetic and nitrogen-fixing capacity, and are halotolerant (euryhaline).
4. Use as claimed in claim 2 wherein, the marine cyanobacteria used is selected from a class of cyanophyceae namely *Lyngbya, Oscillatoria, Sprulina, Anabaena* and *Synechocystis,* which has the affinity for calcium ions.
5. Use as claimed in claim 2 wherein, the sea-brine and sub-soil brine contains total dissolved salt in the range of 1,10,000 to 2,30,000 ppm, calcium content in the range of 0.5 to 0.05 percent and density in the range of 10 to25.5°Be'.
6. Use as claimed in claim 2 wherein, the cyanobacteria removes 20 to 70 % calcium ions present in the sea brine and sub-soil brine.
7. Use as claimed in claim 2 wherein, the calcium removal from brine through biological means (cyanobacteria) is cost effective and requires no external source of energy, chemical or nutrients.
8. Use as claimed in claim 2 wherein, the cyanobacteriae selected have a high salinity tolerance and can function most efficiently.
9. Use as claimed in claim 2 wherein, the cyanobacteriae selected are self-sustaining and therefore recycled for further use.
10. A process for removing calcium ions from sea-brine and sub soil brine having density range 10 to 25.5°Be', said process comprising culturing the cyanobacteria, inoculating the said cyanobacteria culture to raw brine of 10 to 25.5°Be', filtering the resultant mixture to obtain a brine having less calcium and to separate the cyanobacteria which can be reused if desired.

11. A process as claimed in claim 10 wherein, the cyanobacteria removes 20 to 70 % calcium ions present in the sea brine and sub-soil brine.

12. A process as claimed in claim 10 wherein, the marine cyanobacteria used is filamentous in nature, possess photosynthetic and nitrogen-fixing capacity, and is halotolerant (euryhaline).

13. A process as claimed in claim 10 wherein, the marine cyanobacteria used is selected from the group consisting of *(i) Lyngbya, (ii) Oscillatoria, (iii) Spirulina, (iv) Anabaena, and (v) Synechocystis.*

14. A process as claimed in claims 10 wherein, the sea-brine and sub-soil brine contains total dissolved salt in the range of 1,10,000 to 2,30,000 ppm; calcium content in the range of 0.5 to 0.05 per cent; and density in the range of 10 to 25.5°Be'.

15. A process as claimed in claim 10 wherein, the calcium removal from brine through biological means (cyanobacteria) is cost effective and requires no external source of energy, chemical or nutrients.

16. A process as claimed in claim 10 wherein, the removal of calcium by cyanobacteria from brine is eco-friendly and does not generate/liberate any hazardous substance in the environment.

17. A process as claimed in claim 10 wherein, cyanobacteriae are selected from a class of cyanophyceae namely *Lyngbya, Oscillatoria, Sprulina, Anabaena* and *Synechocystis*, which have the affinity for calcium ions.

18. A process as claimed in claim 10 wherein the cyanobacteriae selected have a high salinity tolerance and can function most efficiently.

19. A process as claimed in claim 10 wherein the selected cyanobacteriae are self-sustaining and therefore can be recycled.

20. A process for the removal of calcium ions from brine by marine cyanobacteria, which comprising the steps of:

i) culturing the marine cyanobacteria for a period ranging from 42 to 48 hours, to obtain culture,

ii) inoculating the above marine cyanobacteria culture to raw brine of 10 to 25.5°Be at temperature ranging from 20 to 40°C,

iii) aging the above said mixture for a period ranging from 3 to 96 hours in static condition at a temperature ranging from 20 to 40°C,

iv) maintaining the concentration of cyanobacteria in the range of 2 to 10 grams per liter by fresh weight in sea brine or subsoil brine,

v) filtering the resultant mixture to separate cyanobacteria and collecting the treated brine solution separately,

vi) adding the cyanobacteria so obtained to a brine of lower density where it oozes the calcium to its maximum,

vii) re-inoculating the mixture so obtained as in (vi) at controlled rate to the fresh brine of higher density in order to further uptake/adsorb calcium, and

viii) obtaining the biomass with the self sustaining (autotrophic) property of cyanobacteria with euryhaline that makes these cyanobacteria acclimatize and increase in biomass in severe brine condition without any external source of nutrients or energy.